

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
SHERMAN DIVISION**

VIRGINIA INNOVATION SCIENCES, INC., Plaintiff, v. AMAZON.COM, INC., et al. Defendants.	Civil Action No.4:18-cv-00474-ALM <i>Consolidated Lead Case</i>
INNOVATION SCIENCES, LLC, Plaintiff, v. RESIDEO TECHNOLOGIES, INC., Defendant.	Civil Action No.4:18-cv-00475-ALM <i>Member Case</i>
INNOVATION SCIENCES, LLC, Plaintiff, v. HTC CORPORATION, Defendant.	Civil Action No.4:18-cv-00476-ALM <i>Member Case</i>
INNOVATION SCIENCES, LLC, Plaintiff, v. VECTOR SECURITY, INC., Defendant.	Civil Action No.4:18-cv-00477-ALM <i>Member Case</i>

DEFENDANTS' RESPONSIVE CLAIM CONSTRUCTION BRIEF

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I. INTRODUCTION

The asserted patents describe a hodge-podge of functions for which they provide no actual solution: a diaper monitoring controller that receives a signal from a transmitter in a baby’s diaper (“DCSM”); a conversion module (“MTSCM”) that converts a signal from any type of wireless network for display on any device; and a wireless HUB (“WHUB”) that receives payment information from a mobile device using short range wireless communications.

Each of these, as disclosed in the asserted patents, is no more than an aspiration. The patents disclose no technology for achieving the results they are supposed to accomplish. The claims recite the use of either black boxes or otherwise conventional computers that are “configured” to perform a desired function in some undisclosed way. The specifications provide no solution either, pointing only to the black boxes (*e.g.*, the “DCSM,” “MTSCM,” and “WHUB”) without disclosing any structure or algorithm to do what is claimed. In short, the patents do not claim any definite machine, algorithm, or system. Plaintiff capitalizes on this to apply the claims to technology the patentees could not have contemplated and certainly did not invent. For example, Plaintiff argues that the claimed *diaper condition sensing module* (DCSM) in fact applies to:

home security monitoring, televisions, monitors, video cameras, fire alarms, theft sensors, home or office appliances, PC, handsets, printers, PALM devices, headsets, game controllers, refrigerator, cable modems, TV set top boxes, ovens, and other devices.

(Op. Br. at 11 n.4.) Indeed, according to Plaintiff, the claims cover “*any device* that can sense the condition of an item and relay information about that condition to another device.” (*Id.* (emphasis added).) These claims epitomize what the Federal Circuit has described as the “vice of functional claiming”: identifying a desired result and claiming the result rather than a specific means for

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achieving it, thereby preempting all current and future solutions developed by others. *Halliburton Energy Servs., Inc. v. M-I LLC*, 514 F.3d 1244, 1255 (Fed. Cir. 2008). Or, in other words, the asserted patents claim functions and results, no matter how achieved, while contributing no actual solution or technological innovation to the public.

This wholesale preemption of future innovation is precisely what our patent laws, including pre-AIA § 112, ¶ 6, were intended to prevent. *See Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1349-51 (Fed. Cir. 2015) (en banc) (imposing new standard of indefiniteness to address “proliferation of functional claiming untethered to § 112, para. 6 and free of the strictures set forth in the statute”). Plaintiff attempts to ensnare a slew of disparate and unrelated technologies—Amazon’s Dash Button, Echo smart speakers, and Fire TV set top boxes, Vector and Resideo’s home security systems, and HTC’s smartphones—without meeting the exacting disclosure requirements of § 112, ¶ 6. Our patent laws stand in the way of such improper rent seeking. The Court should hold the claim terms discussed below indefinite, adopt Defendants’ proposed constructions, and reject Plaintiff’s improper attempt to capitalize on the innovation of others.

II. THE ASSERTED PATENTS

Plaintiff Virginia Innovation Sciences, Inc. (a/k/a Innovation Sciences, LLC)¹ currently asserts 32 claims² from four related patents—Nos. 9,912,983 (the “’983 patent”), 9,729,918 (the

¹ “Plaintiff” refers individually and collectively to Virginia Innovation Sciences, Inc. (“VIS”) and Innovation Sciences, LLC (“Innovation”). The Court granted Plaintiff’s motion for substitution of Innovation for VIS in Case Nos. 18-cv-475, -476, and -477, but Plaintiff’s opposed motion for substitution remains pending in the lead case. (*See* Dkt. 22.)

² In the full consolidated proceeding, Plaintiff asserts claims 22, 24, 27, 39, 62, 64, 67, 80, 105, 108, 116, 122, and 143 of the ’983 patent, claims 28, 38, 42, 112, 113, 116, 128, and 135 of the ’918 patent, claims 2, 5, 6, 20, 22, 52, 60, 98 of the ’798 patent, and claims 1, 16, and 29 of the ’443 patent. Defendants address certain claim terms and phrases from unasserted independent claims on which asserted dependent claims rely. Each of Amazon, HTC, and Vector seeks construction only of terms appearing in claims asserted against them. Resideo only seeks construction of “updated status [of the item]”/ “updated item status” and joins in the argument for that term.

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“’918 patent”), 9,942,798 (the “’798 patent”), and 9,721,443 (the “’443 patent”) (collectively, the “asserted patents”)—against Defendants.³ The ’983, ’918, and ’798 patents (collectively, the “’983 patent family”) share a common specification, including nearly the entire disclosure of the ’443 patent.

The patents describe and claim an assortment of black boxes defined only by the patentee’s desired function or result. These include: (1) the “Local Customized Network” or LCN, which locally caches Internet content near the geographic location at which it is most likely to be accessed; (2) the WHUB, which communicates with mobile devices to enable secure payments; (3) the DCSM and CRC, which respectively send and receive signals from a sensor within a diaper to alert caregivers when the diaper is wet; and (4) the MTSCM, which converts any signal over any existing or “to-be-developed” wireless network for display on any desired device. (*See generally* asserted patents.)

LCN. The first idea described in the patents is the “Local Customized Network (LCN)” configured to locally cache Internet content near the geographic location at which it is most likely to be accessed, thereby purportedly increasing the speed at which that content is delivered. (’983 patent at

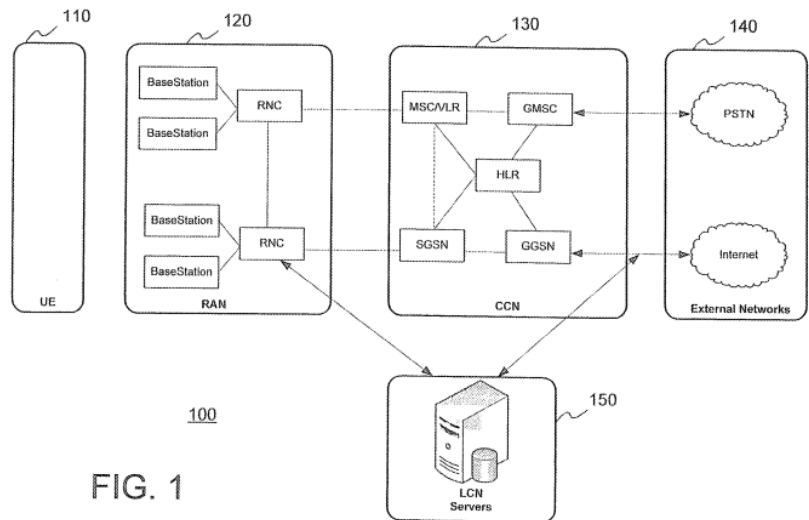


FIG. 1

³ “Defendants” refers collectively to Amazon.com, Inc., Amazon Digital Services, LLC, and Amazon Web Services, Inc., (collectively, “Amazon”), Resideo Technologies, Inc. (“Resideo”), HTC Corporation (“HTC”), Vector Security, Inc. (“Vector”). Plaintiff asserts the ’983 patent against all Defendants, the ’798 and ’918 patent against HTC and Amazon, and the ’443 patent only against Amazon.

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Abstract;⁴ *see also id.* at 7:42-10:5, Fig. 1 (reproduced right).) The patents describe the LCN 150 solely by its function, describing that it is “configured to include a content access monitoring module, which monitors Internet access and determines content applicable to the designated location of the LCN 150” and “maintain a cache of locally applicable Internet content, which includes refreshing to add new content and remove stale content as determined by information received from the monitoring functionality.” (*Id.* at 7:46-49, 7:54-58.) The patents use “LCN” to capture the patentee’s desired results, but do not disclose *how* the LCN accomplishes them.

WHUB. The patents also describe a “wireless HUB (WHUB)” that enables secure payment. (*See id.* at 10:33-42; *id.* at Figure 4.) The WHUB, provided in a kiosk or at home, authenticates a user’s mobile device using a short range wireless connection, such as Radio Frequency Identification (RFID) or Near Field

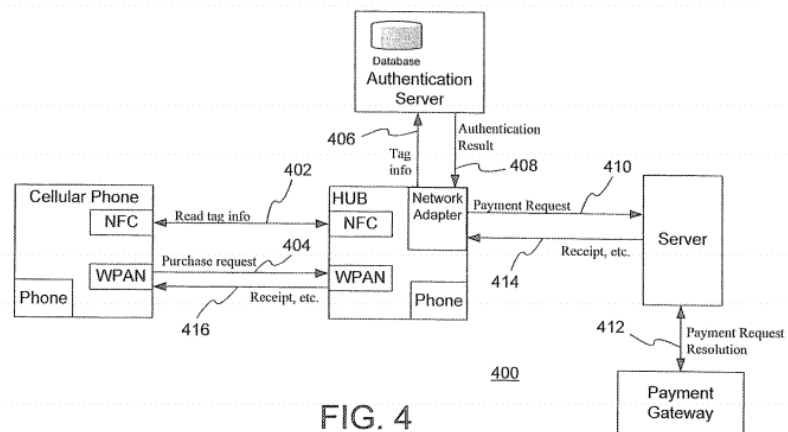


FIG. 4

Communication (NFC), and then sets up a higher bandwidth wireless connection with the mobile device through which the WHUB securely receives payment information for the user. (*See id.* at 10:33-54.) The WHUB can then forward the payment information to a remote merchant server to complete the purchase. (*See id.* at 10:33-11:14.) The asserted patents never explain *how* the WHUB performs these intended functions—merely that it can do so.

⁴ For ease of reference, Defendants cite to disclosures in the '983 patent, which Plaintiff asserts against all Defendants. Citations to one patent refer to the corresponding disclosure in the other asserted patents.

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DCSM and CRC. The patents describe a third idea directed to a diaper management system comprising a “diaper condition sensor module” (DCSM) which detects the status (*e.g.*, wetness) of a diaper and sends a corresponding “diaper status update” to a “central receiver/controller (CRC).” (*Id.* at 12:43-14:40; *see generally id.* at Figs. 5-7.)

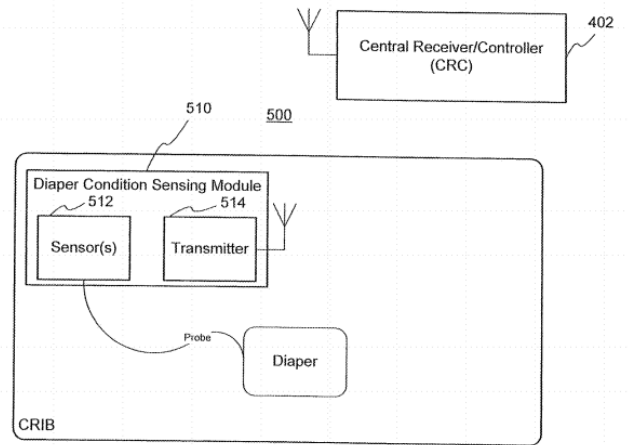


FIG. 5

The CRC is “configured to distinguish children in need of new diapers from those that are not and respectively sends messages to appropriate caregivers.” (*Id.* at 13:53-55.) A unique identifier is associated with each diaper condition sensor module and included with each transmitted status update to the CRC, thereby enabling the CRC to monitor and differentiate multiple diapers. (*Id.* at 13:3-62.) The patents describe the CRC only by its function. (*See id.* at 12:44-52 (“The diaper management system 500 includes a diaper condition sensing module 510 and a central receiver/controller (CRC) 520. The CRC 520 operates on a conventional processing platform and is configured to communicate wirelessly with the diaper conditions sensing module 510. The CRC 520 also includes a network interface. The wireless and/or network interface accommodate the transmission of appropriate alerts to care givers.”); *id.* at 13:18-23.)

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The patents also disclose a diaper ordering system that combines the second and third ideas described above. (*Id.* at 14:66-

15:3; *see generally id.* at 14:41-

15:51.) Because the black

boxes disclosed in the patents

have no actual structure or

substance to them, they can be

combined or interchanged in

any manner imaginable. The

patents take full advantage of

this by combining and reassigning functions arbitrarily among the different units: the WHUB, for

example, can not only receive payment information, but can *also* receive updates about a diaper,

the function otherwise supposedly performed by the CRC. (*See, e.g., id.* at 14:53-59.) The WHUB

then compares diaper usage against the household inventory. (*Id.* at 15:9-38.) When the household

diaper supply is running low, the user is alerted and may purchase diapers online from a local

merchant (determined, without explanation, by the LCN) using his or her mobile device. (*Id.* at

12:47-52.) Once the WHUB authenticates the user's mobile device, the mobile device sends the

diaper purchase request through the WHUB to a local merchant. (*Id.*)

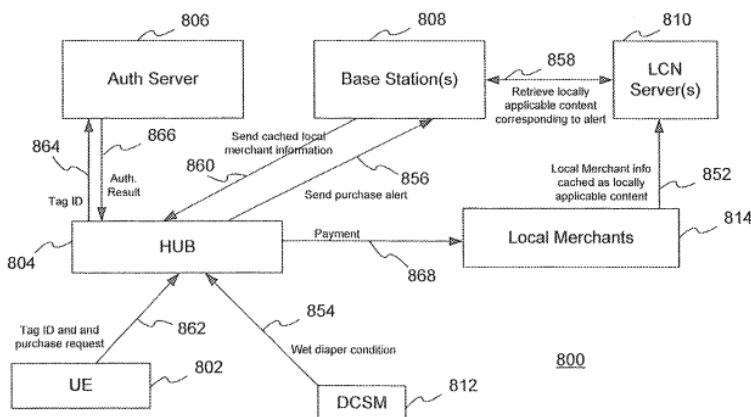


FIG. 8

The '443 patent asserted here is a continuation of U.S. Patent No. 9,369,844 (the "'844

patent"), a patent Judge O'Grady analyzed and construed in *Virginia Innovation Sciences., Inc. v.*

Amazon.com, Inc., No. 1:16-cv-00861 (E.D. Va.) ("*VIS I*"), and both patents are directed to the

same system for monitoring diaper wetness. *Id.*, 2017 WL 3599642 (Aug. 18, 2017), *appeal*

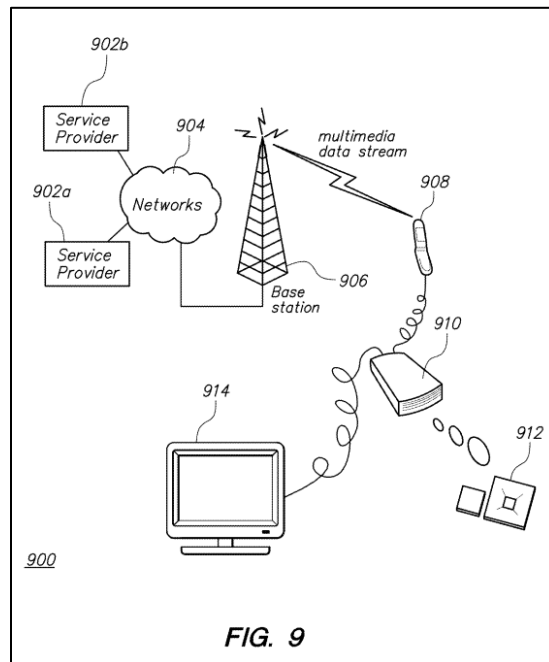
docketed, No. 18-1495 (Fed. Cir. Jan. 31, 2018). According to the *VIS I* court, the '844 patent's

claims "conflate two distinct devices described in the specification: (1) the user's mobile device

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(UE) that contains an associated authentication tag and (2) the diaper sensor [DSCM], which is a wireless sensor used to monitor diapers,” the combination of which “would require the user to place a cell phone or similar mobile device inside a baby’s diaper for monitoring purposes.” (*Id.* at *14-15.) The court noted that this far-fetched combination of concepts made the claims difficult to construe. (*Id.*) The same challenge exists here, because Plaintiff repurposed the specifications from the patents in *VIS I* for the asserted patents here, and asserts similarly unintelligible claims.⁵

MTSCM. In addition to the ideas described above, the ’983 patent family also describes a video conversion system. This includes a “mobile terminal signal conversion module” (“MTSCM”), which converts video signals received from a mobile device and transmits the converted signals to a different screen, such as a television, for display. (’983 patent at 16:29-31; *id.* at Figure 9.) With reference to Figure 9, the ’983 patent family describes transmission of video content from a mobile network 904 to a mobile device 908, which then transmits the video content to a MTSCM 912 for conversion. (*Id.* at 16:29-62.) The MTSCM 912 transmits the converted



video signal to a television 914 for display in the home. (*Id.* 16:62-17:10.) The MTSCM is the

⁵ The original claims of the ’844 patent were directed to a system for locally caching Internet content. (Ex. 2 (’844 patent file history, Sept. 2, 2014 application at 24).) Over a year after Amazon released the Dash Button, a mobile device that enables customers to purchase a pre-determined product by pushing a button, the applicant amended the claims of the ’844 patent to recite a system for automatically purchasing products based on an updated condition of merchandise. (Ex. 3 (’844 patent file history, Apr. 26, 2016 Amendment at 9-17).) Judge O’Grady noted that the system of the amended claims “is not described at any point in the specification.” *VIS I*, 2017 WL 3599642, at *14.

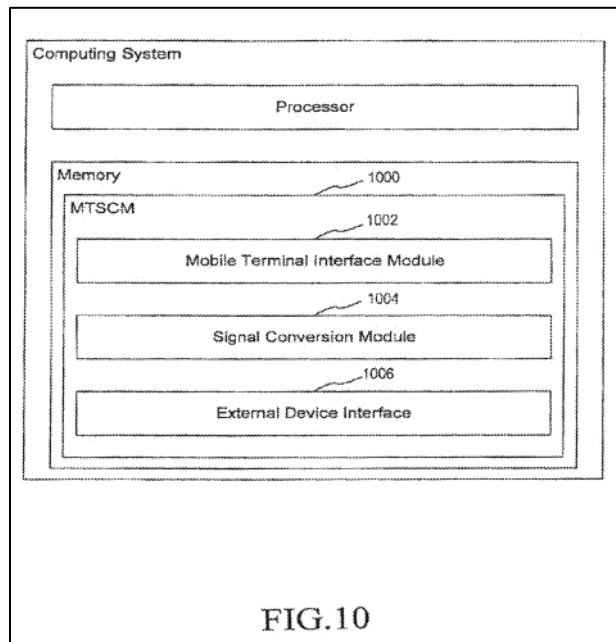
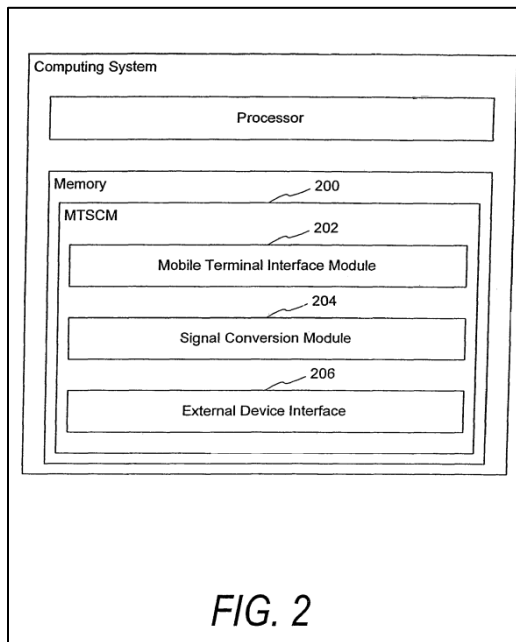
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core of this system and is described as a black box that can be anything, including “software, firmware, hardware, or any combination thereof” or “[a]ny conventional or to-be-developed execution platform.” (*Id.* at 17:26-34.) The specification also describes this idea in functional terms, noting that it can use “any conventional or to-be-developed technology for delivering voice and/or data to mobile terminals.” (*Id.* at 16:13-16.)

Judge O’Grady invalidated claims directed to the MTSCM under § 101 in the prior cases *VIS* filed against Amazon and HTC in the Eastern District of Virginia. *See VIS I*; *Va. Innovation Scis., Inc. v. HTC Corp.*, No. 1:16-cv-01350 (E.D. Va.) (“*VIS-HTC I*”).⁶ The court held that the MTSCM disclosed in a related patent, 7,899,492, and its seven continuation patents (collectively referred to as the “’492 patent family”), were directed to unpatentable subject matter. *VIS I*, Dkt. 57 at 24. The figures below, graphical depictions of the MTSCM from Figure 2 of the ’492 patent family and Figure 10 of the ’983 patent family, confirm that the MTSCM at issue in this case is the very same black box Judge O’Grady analyzed in *VIS I*:

⁶ In Plaintiff’s case against HTC, Judge O’Grady also issued an order invalidating the ’492 patent family, referencing the reasoning in the *VIS I* case against Amazon. *VIS-HTC I*, Dkt. 77.

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With reference to this figure, Judge O’Grady explained:

[T]he MTSCM indeed describes an ends rather than a means. For example, the signal conversion module (204) “recognizes the multimedia signal format and processes the multimedia signal to provide a converted signal.” *Id.* at 5:24-27. This explanation does not describe how the signal is converted. Instead, it merely directs the reader to design a product that would convert the signal in an appropriate fashion. Further, the MTSCM (200) itself can be provided “as software, firmware, hardware, or any combination thereof.” *Id.* at 4:45-48. In addition, “the described functionality can be provided by an MTSCM having fewer, greater, or differently named modules.” *Id.* at 4:55-60. Thus, in effect, the MTSCM can be provided by anything that achieves the claimed result, so long as the video signal is compressed and decompressed.

VIS I, Dkt. 57 at 24. The court further noted that “[i]nstead of claiming a technological building block, the ’492 patent family’s abstract claims place[d] a ceiling on future innovation,” and “[t]he concept of converting a mobile video signal to an HDTV is an abstract concept.” *VIS I*, Dkt. 57 at 32. The Federal Circuit affirmed per curiam. *Va. Innovation Scis., Inc. v. Amazon.com, Inc.*, No. 17-1482, Dkt. 88 (Fed. Cir. Apr. 11, 2018).

The ’983 patent family also describes two functions of the MTSCM that Judge O’Grady analyzed in *VIS I* in construing another patent, No. 8,135,398 (the “398 patent”). First, the

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MTSCM receives multimedia content wirelessly in the home that is “destined” for a particular television. (’983 patent at 4:7-23; *id.* at Figs. 18-20.) Second, the MTSCM sends the converted content to the television on a predetermined channel, and the user can view the content by tuning the television to that channel. (*Id.* at 27:60-28:16.) Judge O’Grady granted summary judgment of non-infringement of the ’398 patent, rejecting infringement theories similar to those Plaintiff recycles in this case.

Other elements. The ’983 patent family describes additional miscellaneous black boxes whose functions are interchangeable with other functional elements. The ’983 patent family describes a Management Center (“MC”) System that “receives, selects, converts, compresses, decompresses and routs [sic] data to the user terminals.” (*Id.* at 21:32-35.) The MC System can perform any or all of the functions of the CRC diaper monitor and the MTSCM signal converter. (*Id.* at 21:55-58 (The MC System is capable of “receiving and transmitting signals from user terminals including televisions, monitors, diaper monitoring, a video camera, fire alarm, theft sensor, etc.”); *id.* at 21:59-63 (“With regard to conversion, the MC System includes a converter module with routines for selecting, extracting, compressing, decompressing, adjusting data, and converting the data format and/or power level and/or data package size/format.”); *id.* at 27:41-43 (The “MC System is similarly equipped to provide the noted cellular communications capability and MTSCM functionality.”).)

The ’983 patent family also describes a “centralized HUB system” (“CHS”) which can “perform the functions described for the MC System.” (*Id.* at 24:28-29.) Like the MC System, the patents describe the CHS as a black box capable of performing the functions described above, and more. (*Id.* at 24:25-29 (“The CHS can also be built into a cable modem, TV set top box, or other device. The signals, for example from a wet diaper, fire alarm, or theft sensor can also be sent from the CHS. Finally it is noted that the CHS may perform the functions described above

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for the MC System.”); *id.* at 27:44-47 (“It is also noted that there may be embodiments where the functionality is divided between the set top box, television set, MC System and/or CHS in various ways involving at least two and sometimes all three devices.”).)

The asserted claims simply mix and match the concepts described above. For example, claim 22 of the ’983 requires the following:

22. A wireless HUB system for managing information communications comprising:

an input interface configured to receive a wireless signal through a wireless communication network;

a decoder; and

a network interface configured to provide a communication through a network communication channel,

wherein the wireless HUB system is configured to perform a conversion of the wireless signal to accommodate production of a corresponding information content, the wireless signal comprising a compressed signal, the conversion comprising decompressing the compressed signal;

wherein the decoder is configured to decompress the compressed signal;

wherein the wireless HUB system is further configured to communicate, through the network communication channel, information for managing an item status of an item in connection with a short range wireless communication regarding an updated status of the item; and

wherein the network communication channel is separate from a wireless channel for the short range wireless communication.

The claim is directed to the wireless HUB. It recites that the wireless HUB is configured to convert a received wireless signal, which is described in the specification as being performed by another black box—the MTSCM (which both Judge O’Grady and the Federal Circuit held unpatentable). The claim combines this idea with the idea of communicating “item status” information, which is described in the specification only as the signal the diaper sensor condition module sends to another black box—the “central receiver/controller” or CRC—when a diaper is wet. Additionally, the claim recites “short range wireless communication,” which is described in the specification as RFID or NFC communication between a user’s mobile device and a wireless HUB to authenticate

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the device to the HUB in order to make a secure payment. The specification does not explain how a device would perform any one of these functions, let alone how a single device would perform all of them.

III. THE DISPUTED CLAIM TERMS AND PHRASES

A. Terms Governed by § 112, ¶ 6

Our patent laws do not allow claims directed solely to what an invention accomplishes. Instead, an inventor must disclose, and can only claim, her specific and novel *solution* to achieve that result. *See O'Reilly v. Morse*, 56 U.S. (15 How.) 62, 120 (1853) (“no patent can lawfully issue” for a mere “effect . . . distinct from the process or machinery necessary to produce it”).

In section 112, ¶ 6, Congress limited this so-called “functional claiming”—the practice of claiming a result without disclosing how to accomplish it. *See Williamson*, 792 F.3d at 1349; *Function Media, LLC v. Google, Inc.*, 708 F.3d 1310, 1319 (Fed. Cir. 2013). A patentee can describe the invention by the functions it performs, but if it does, the scope of the claims is limited to the specific solutions disclosed in the specification. Section 112, ¶ 6 is thus a limited safe harbor for claiming an invention by its function.

The statute provides that where a claim element is expressed only as a “means for” performing a function “without the recital of structure, material, or acts in support thereof,” that claim “shall be construed to cover the corresponding structure, material, or acts described in the specification.” 35 U.S.C. § 112, ¶ 6. But a functional claim that does not literally recite a “means for” performing a function must still comply with section 112, ¶ 6 if the claim itself does not recite a sufficiently definite structure or else recites a structure that is not sufficient to perform the recited function. *Williamson*, 792 F.3d at 1349-50. Whether section 112, ¶ 6 applies ultimately depends on “whether one of ordinary skill in the art would understand the claim with the functional language, in the context of the entire specification, to denote sufficiently definite structure or acts”

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to “perform entirely” the recited function. *Danco, Inc. v. Fluidmaster, Inc.*, No. 16-cv-73-JRG-CMC, 2017 WL 4225217, at *7 (E.D. Tex. Sept. 22, 2017) (citing *Personalized Media Commc’ns LLC v. Int’l Trade Comm’n*, 161 F.3d 696, 705 (Fed. Cir. 1998)). Even if a claim term connotes some *generic* structure, it is still insufficient if the structure cannot perform the function recited in the claims. *See id.*

If the claims do not provide the structure required to achieve the claimed result—*i.e.* if § 112, ¶ 6 applies—then the specification must disclose it; and if it does not, the claim is invalid as indefinite. *Williamson*, 792 F.3d at 1350-52. For claims that recite a computer-implemented function, in particular, the specification must disclose a specific *algorithm* for achieving the claimed function. *Augme Techs., Inc. v. Yahoo! Inc.*, 755 F.3d 1326, 1337 (Fed. Cir. 2014).

All of the asserted patents recite black box components—“wireless HUB,” “management center system,” “central controller,” “wireless signal conversion apparatus,” and “wireless transmitter”—“configured to” carry out a claimed function. These claims do not recite a structure sufficient for performing the functions. The phrasing “configured to” makes clear that *something else* has to be done *to* the black box to achieve the claimed function—some algorithm or special programming must be provided for it to do what is claimed. Because the claims do not provide the missing “configuring,” they must be construed under § 112, ¶ 6, and the patents’ specifications must provide an algorithm to limit the claims.

The Federal Circuit has previously construed similar “configured to” claims under § 112, ¶ 6. For example, in *Diebold Nixdorf, Inc. v. Int’l Trade Comm’n*, the Federal Circuit construed a claim reciting a cheque standby unit “configured to” hold a check pending the customer’s confirmation of a bank deposit. 899 F.3d 1291, 1296 (Fed. Cir. 2018). The Federal Circuit construed “cheque standby unit” under § 112, ¶ 6 because “the claims [did] not recite *any* structure,

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much less ‘sufficiently definite structure,’ for the ‘cheque standby unit’” and the “claims describe[d] the term . . . solely in relation to its function.” *Id.* at 1298 (emphasis in original).

Courts in this District and across the country have held the same. In *St. Isidore Research, LLC v. Comerica Inc.*, for example, Judge Payne applied § 112, ¶ 6 to two claims reciting processors “configured to” carry out functions. No. 15-cv-1390-JRG-JSP, 2016 WL 4988246, at *14 (E.D. Tex. Sept. 19, 2016). The processor recited in the claims was “defined only by the function that it performs,” and the claim did not “describe how the [claimed] processors interact with each other or with other limitations in the claim to achieve their objectives.” *Id.*; *see also Konami Gaming, Inc. v. High 5 Games, LLC*, No. 14-cv-01486-RFB-NJK, 2018 WL 1020120, at *12-14 (D. Nev. Feb. 21, 2018) (construing “processor configured to execute a game displaying a matrix of symbol containing elements” under § 112, ¶ 6, and holding claim indefinite because claim and specification merely showed what “*appears* on the ‘display’” rather than “an algorithm or programming to create or generate what is on ‘the display’”), *aff’d*, 756 F. App’x 994 (Fed. Cir. 2019); *Syneron Med. Ltd. v. Invasix, Inc.*, No. 16-cv-00143-DOC-KES, 2018 WL 4696971, at *13-15 (C.D. Cal. Sept. 5, 2018) (claims reciting “processor . . . configured to control RF energy” governed by § 112, ¶ 6 because processor was defined only by its function and claims said nothing about how the processor operates to achieve the recited function); *Verint Sys. Inc. v. Red Box Recorders Ltd.*, 166 F. Supp. 3d 364, 384 (S.D.N.Y. 2016) (construing “analysis module configured to . . . receive an identifier tagged onto the data packets” under § 112, ¶ 6, noting “module is a black box nonce term that performs a function consistent with the format of MPF claiming” and holding claim indefinite because “specification d[id] not provide an algorithm for performing the claimed function”); *see also id.* at 379-83 (applying § 112, ¶ 6 to claims reciting “computer application,” “communication monitoring system,” and “monitoring device” “operable to” achieve a claimed function).

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Just as in the cases above, the asserted patents recite either generic components or black boxes followed by a function to be performed by these claim elements. To meet the definiteness requirement, they must be construed under and comply with § 112, ¶ 6. The following terms do not, and are therefore indefinite.

1. “wireless HUB system,” “wireless hub,” “centralized HUB system,” “centralized hub system”

The term “centralized hub system” appears in claims 1, 2, and 81 of the ’798 patent. The term “centralized HUB system” appears in claim 139 of the ’983 patent. The term “wireless HUB system” appears in claims 22, 24, 62, and 117 of the ’983 patent. The term “wireless hub” appears in claims 116, 128, 135 of the ’918 patent. The claims require that these claim elements are “configured to” carry out the following several functions:⁷

- ***Converting wireless signals to produce information for display*** (’983 patent, cls. 22, 62 (“perform a conversion of the wireless signal to accommodate production of a corresponding information content”), ’918 patent, cls. 116, 128, 135 (“perform a conversion of a corresponding signal of the particular information content to accommodate production of the particular information content”), ’983 patent, cl. 139 (“perform a conversion of a multimedia signal corresponding to the information content to accommodate the production of the information content on the high definition digital display, the multimedia signal comprising a compressed signal”));
- ***Receiving, generating and transmitting information about updated item status or for managing item status*** (’983 patent, cl. 117 (“communicate, through the network communication channel, information about the updated status to a user device associated with the item”), ’798 patent, cl. 2 (“communicate the information through the WLAN for said managing the household item status”), ’798 patent, cl. 81 (“communicate information for managing an item status of an item based on a signal regarding an update status of the item, the signal being triggered by a detection of the updated status”); ’983 patent, cl. 22 (“communicate, through the network communication channel, information for managing an item status of an item in connection with a short range wireless communication regarding an

⁷ The parties do not appear to have any dispute as to the functions performed by these or any of the other claim terms under § 112, ¶ 6. They dispute only whether § 112, ¶ 6 applies and, if so, whether the specifications disclose sufficient structure corresponding to the claimed functions.

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- updated status of the item”); *id.*, cls. 24, 117 (“notify a user of the updated status according to a configuration setting”), *id.*, cl. 117 (“receive a signal from the item status sensing device”));
- ***Sending and receiving data comprising a unique identifier*** (*id.*, cl. 117 (“identify the item in connection with recognition of the information corresponding to the unique identifier”), ’918 patent, cls. 116, 128, 135 (“send a data package to the management center system through a wireless communication network based on the request for the particular information content, the data package including information for the unique hub identifier”), *id.* (“receive the particular information content through the wireless communication network in connection with identification of the wireless hub”); ’798 patent, cl. 1 (“receive, through a wireless communication network, an information content requested by a user in connection with identification of the centralized hub system based on recognition of the unique hub identifier, the information content carried by a compressed digital video signal”));
 - ***Transmitting an encoded video signal for reproduction on a high definition display*** (’798 patent, cl. 81 (“transmit the encoded decompressed digital video signal to the high definition digital television through a predetermined communication channel in conjunction with a navigational command for the predetermined communication channel, the predetermined communication channel being the high definition digital output interface connected to the cable”)).

None of the terms connotes a structure sufficient to perform these functions. While the terms “wireless,” “centralized,” and “hub” may individually have some meaning to one of ordinary skill in the art, the combination of those terms does not connote a structure and certainly not one sufficient to perform all the various functions claimed. (Johnson Decl. ¶¶ 43, 48, 63, 68, 73, 78, 83, 88, 153, 163, 193, 382, 387, 392); *Advanced Ground Info. Sys., Inc. v. Life360, Inc.*, 830 F.3d 1341, 1348 (Fed. Cir. 2016) (construing “symbol generator” under § 112, ¶ 6, because “[i]rrespective of whether the terms ‘symbol’ and ‘generator’ are terms of art in computer science, the *combination* of the terms as used in the context of the relevant claim language suggests that it is simply an abstraction that describes the function being performed (i.e., the generation of symbols)” (emphasis in original)). And while the generic computing term “hub” may have some meaning in the art, the terms “wireless HUB” and “centralized HUB” (with “HUB” in all caps)

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are coined terms unique to the asserted patents. They do not connote any structure to one of skill in the art without further explanation, which the patents lack. (*See, e.g.*, Johnson Decl. ¶ 43 (“it is also apparent from the specification’s consistent use of ‘HUB’ in all capital letters that some other (undefined) meaning of ‘HUB’ was intended here”)); *Diebold*, 899 F.3d at 1303 (applying § 112, ¶ 6 to term “cheque system” because it was coined by the applicant). And even if these terms did connote some *generic* structure, they do not connote sufficient structure to “perform entirely” the recited functions, which they must to avoid the requirements of § 112, ¶ 6. *Danco, Inc.*, 2017 WL 4225217, at *7.

For example, claim 22 of the ’983 patent requires the following:

22. A **wireless HUB system** for managing information communications comprising:

an input interface configured to receive a wireless signal through a wireless communication network;

a decoder; and

a network interface configured to provide a communication through a network communication channel,

wherein the **wireless HUB system is configured to perform a conversion of the wireless signal to accommodate production of a corresponding information content, the wireless signal comprising a compressed signal, the conversion comprising decompressing the compressed signal;**

wherein the decoder is configured to decompress the compressed signal;

wherein the **wireless HUB system is further configured to communicate, through the network communication channel, information for managing an item status of an item in connection with a short range wireless communication regarding an updated status of the item;** and

wherein the network communication channel is separate from a wireless channel for the short range wireless communication.

(’983 patent, cl. 22, emphasis added.) The claim defines the “wireless HUB system” only by reference to two functions: (1) converting a compressed signal; and (2) communicating item status information over a wireless communication channel. The claim does not disclose any structure

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for performing the functions. It discloses no way of converting any one signal to any one type of output or content. And it discloses no way of transmitting item status information other than reference to generic wireless communication. Yet the patent claims the *result* of converting any received signal in any format from any network existing or to be developed and extracting from it information content of any type encoded in any manner, thus claiming far more than the patentees invented. Section 112, ¶ 6 exists precisely to provide limits on such vacuous and functional claims. *See, e.g., Halliburton Energy Servs., Inc.*, 514 F.3d at 1255. The other claims that recite the terms “wireless HUB system,” “wireless hub,” “centralized HUB system, and “centralized hub system” similarly do not recite structure for performing the recited functions, as Dr. Johnson confirms. (*See* Johnson Decl. ¶¶ 43, 48, 63, 68, 73, 78, 83, 88, 153, 163, 193, 382, 387, 392.) Plaintiff’s expert Mr. McAlexander provides no contrary opinion; indeed, he does not offer *any* opinion regarding the “wireless hub” terms.

Plaintiff’s arguments that section 112, ¶ 6 does not apply all fail as a matter of law because they focus only on whether the “hub” terms connote some *generic* structure, while ignoring completely the second requirement that to avoid § 112, ¶ 6 the claim must recite a structure *for performing the function recited in the claim*. *See Williamson*, 792 F.3d at 1349. Thus, even if the term wireless hub implied *some* structure—like a generic processor or networking hardware—§ 112, ¶ 6 nonetheless applies because such generic hardware cannot perform the claimed functions without special programming. (*See, e.g., Johnson Decl.* ¶ 45.)

Plaintiff’s own proposed constructions confirm this. Plaintiff proposes the following constructions:

- “wireless HUB system”: one or more devices capable of wireless communication for communicating with user devices, sensors, or appliances.
- “centralized HUB system”: one or more devices at a central location capable of wireless communication for communicating with user devices, sensors, or appliances.

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- “wireless hub”: A device capable of wireless communication for communicating with user devices, sensors, or appliances.

None of these constructions identifies a structure sufficient to perform all of the claimed functions. For example, a generic device that is merely “capable of wireless communication” is not a structure that can perform the function of converting a signal for production on a display or communicating information regarding item status. (*See, e.g.*, ’983 patent, cl. 22.) Plaintiff itself notes that the patents describe extensively the various functions that the “hubs” must perform. (Op. Br. at 12-13.) But Plaintiff’s proposed construction does not show how the wireless hub or centralized hub would do any of this, nor does it capture any of the functionality described in the patents. Instead, Plaintiff concedes the purely functional nature of these terms, as its nearly identical constructions for them merely recite merely another high-level function: communicating with user devices, sensors, or appliances. In doing so, Plaintiff concedes that the purely functional nature of these terms. *See Diebold*, 899 F.3d at 1298-1302 (construing “cheque standby unit” under § 112, ¶ 6 where patentee “did little more than opine that a skilled artisan would understand the functional term ‘cheque standby unit’ to be any structure capable of performing the claimed function”).

Plaintiff’s other arguments against the application of § 112, ¶ 6 fail as well.⁸ First, Plaintiff argues that the term “hub” connotes structure because it is “found in technical dictionaries.” (Op. Br. at 22.) But the fact that a single word in these claim terms appears in a dictionary does not change the fact that the larger phrases in the claims do not connote any structure, let alone structure sufficient to perform the claimed functions. *See Advanced Ground Info. Sys., Inc.*, 830 F.3d at

⁸ Plaintiff relies primarily on *TecSec, Inc. v. IBM Corp.*, but that case was decided before the en banc decision in *Williamson* changed the governing standard. 731 F.3d 1336, 1347 (Fed. Cir. 2013). The case did not address when the presumption against the application of § 112, ¶ 6 may be overcome. The *TecSec* court held that § 112, ¶ 6 did not apply to two “means” terms—“system memory means” and “digital memory means”—because “system memory means” performed the simple function of “storing data” and the claims did not actually recite a function for the “digital memory means” to perform. *Id.* at 1347-48. In contrast, the claims here perform complicated functions for which the claims provide no structure or algorithm.

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1348. Moreover, as discussed above, the term “HUB” in all caps is a coined term that, presumably has a different meaning than “hub” and is not sufficiently defined in the patents. *Id.*; (Johnson Decl. ¶ 48).

Second, Plaintiff argues that the addition of “wireless” and “centralized” to the term “hub” provides “adjectival qualification” that connotes a specific structure. (Op. Br. at 22.) This argument lacks merit. “While it is true that the use of ‘adjectival qualifications’ can provide additional structure, ‘not just any adjectival qualification or functional language will suffice.’” *Nichia Corp. v. VIZIO, Inc.*, No. 16-0545 SJO (MRWx), 2019 WL 1966664, at *6 (C.D. Cal. Mar. 13, 2019) (quoting *Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.*, 711 F.3d 1348, 1364-65 (Fed. Cir. 2013)). Here, the fact that the hub must communicate wirelessly does not convey a *structure* to do so. For example, claim 22 of the ’983 requires that the wireless HUB system “perform a conversion of the *wireless signal* to accommodate production of a corresponding information content.” The term “wireless” provides no qualification at all; it just describes the “hub” by reference to one of its many claimed functions, wireless communication. *See Lochner Techs., LLC v. Lenovo (U.S.) Inc.*, No. 2:10-cv-430-JRG, 2015 WL 293625, at *13-14 (E.D. Tex. Jan. 21, 2015) (adding the qualifier “display” to the term “element” did not add sufficient structure). Similarly, the fact that the hub must be “centralized” does not disclose a structure. It only raises the question of what it means to be “centralized” (*i.e.*, central relative to what?) and, in any event, limiting a claim term to a location does not connote structure. *Diebold*, 899 F.3d at 1298 (specifying location in apparatus did not connote sufficient structure). These adjectives do not transform a generic hub into a structure capable of implementing the claimed functions.

Third, Plaintiff argues that the claims recite “additional structural interconnectivity with other elements of the claims.” (Op. Br. at 33.) In support, it points to the requirement that the

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claimed wireless hub must communicate with a management center system, send and receive information over a wireless network, and contain other functional elements (reader, transceiver, and network adapter) incidental to the wireless communication. That the claims define the wireless hub by its ability to communicate with other elements only confirms that it is a black box that does nothing but carry out the recited functions; it does not connote structure to carry out the functions. *See, e.g., Diebold*, 899 F.3d at 1298-99 (claim requiring “cheque standby unit” to “hold[] checks and then either return[] them to the user or continu[e] to process them pending a user instruction” suggests only that *some* structure is required, but “does not offer any clues as to what such structure might be”). Indeed, while the claim requires interaction between the wireless hub and other claim elements, it does not describe *how* the wireless hub interacts with other elements to perform these intended functions (*e.g.*, converting wireless signals to produce information for display; receiving, generating, and transmitting information about updated item status or for managing item status; sending and receiving data comprising a unique identifier; and transmitting an encoded video signal for reproduction on a high definition display). *See St. Isidore Research, LLC*, 2016 WL 4988246, at *14. These terms must therefore be construed under § 112, ¶ 6.⁹ *See Williamson*, 792 F.3d at 1349.

Because § 112, ¶ 6 applies, to satisfy the definiteness requirement the specifications must disclose an algorithm for the computer-implemented functions recited in the claims. *Williamson*, 792 F.3d at 1351-52; *Augme Techs., Inc.* 755 F.3d at 1337. The asserted patents do not disclose such an algorithm. (Johnson Decl. ¶¶ 44-46, 49-51, 64-66, 69-71, 74-76, 79-81, 84-86, 89-91, 94-96, 154-56, 164-66, 194-96, 383-85, 388-90, 393-95.) And Plaintiff does not point to *any* structure

⁹ Plaintiff mischaracterizes Dr. Johnson’s opinion that a generic “hub is not known to perform the function recited in th[e] claim term[s]” as conceding the novelty of the asserted claims. (*See* Johnson Decl. ¶ 43; Op. Br. at 24.) Dr. Johnson’s opinion instead confirms that because a generic hub cannot implement the claimed functions, the patents must disclose an algorithm to comply with § 112. *Danco, Inc.* 2017 WL 4225217, at *7 (claim term must connote structure sufficient to “perform entirely” the recited function). They do not, and are indefinite.

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or algorithm in the specification for performing the functions. (*See* Op. Br. at 24 (arguing that § 112, ¶ 6 does not apply and that “should end the inquiry”).)¹⁰

Because the “wireless HUB system,” “wireless hub,” “centralized HUB system,” and “centralized hub system” terms do not connote structure for performing the claimed functions, and the specifications of the asserted patents do not disclose an algorithm for performing the claimed functions, these claim terms are indefinite under § 112. *Williamson*, 792 F.3d at 1349-54. Moreover, because the patents define these terms solely by reference to their function, but provide no limiting solution for performing the claimed functions, they are also indefinite under § 112, ¶ 2. *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 910 (2014) (claims that do not “inform those skilled in the art about the scope of the invention with reasonable certainty” are indefinite under § 112); (Johnson Decl. ¶ 617).

2. “central controller”

The term “central controller” appears in claim 1 of the ’443 patent. The claim requires that the “central controller” is “configured to” perform the following functions:

- ***Receiving information regarding a change in item status*** (“receive information regarding the item status signal and identify the item in connection with a successful transmission of the item status signal from the wireless transmitter”);
- ***Identifying the item using a unique identifier*** (“identify the item is based on recognition of the unique identifier of the item stored in the memory”);
- ***Processing a purchase request to increase household inventory of the item*** (“perform a processing of a purchase request for the item to increase the household inventory of the item in connection with identification of the

¹⁰ In the joint claim construction statement, Plaintiff identified general purpose processors or functional claim elements, including the MTSCM. (*See also* Johnson Decl. ¶¶ 46, 51, 66, 71, 76, 81, 86, 91, 96, 156, 166, 196, 385, 390, 395 (Dr. Johnson’s analysis of the structure identified by Plaintiff)); *VIS I*, Dkt. 57 at 24 (“[T]he MTSCM can be provided by anything that achieves the claimed result”) Such disclosures do not satisfy the definiteness requirement of § 112 as a matter of law. *Intellectual Ventures II LLC v. FedEx Corp.*, No. 16-cv-980-JRG, 2017 WL 5896180, at *33 (E.D. Tex. Nov. 29, 2017) (disclosure of black box “data modification tool” in patent figure insufficient structure to save claim term from indefiniteness).

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item;” “communicate information for the processing of the purchase request through a network communication channel to complete the processing of the purchase request, the network communication channel being separate from the wireless transmission channel established for the transmission of the item status signal”); and

- ***Sending a confirmation of the purchase*** (“send confirmation information regarding the processing of the purchase request”).

The term “central controller” does not connote structure sufficient to perform these functions, and must therefore comply with § 112, ¶ 6. *See Konami Gaming, Inc. v. Marks Studios, LLC*, No. 14-cv-1485-JAD-CWH, 2017 WL 3174905, at *3-4 (D. Nev. July 25, 2017) (“game controller configured to” perform claimed function referred to a generic processor and was governed by § 112, ¶ 6); *MonkeyMedia, Inc. v. Apple, Inc.*, No. A-10-CA-319-SS, 2013 WL 12076550, at *5 (W.D. Tex. Feb. 22, 2013) (“relativity controller” governed by § 112, ¶ 6 where patent defined it only by its function). While the terms “central” and “controller” may individually have some meaning, the combination of those terms does not connote a structure sufficient to perform the claimed functions. (Johnson Decl. ¶¶ 524, 529, 534, 539, 544); *Advanced Ground Info. Sys., Inc.*, 830 F.3d at 1348 (combination of terms that individually have meaning to one of ordinary skill in the art may still invoke § 112, ¶ 6); *Danco, Inc.*, 2017 WL 4225217, at *7 (to avoid application of § 112, ¶ 6, claim term must connote structure to “perform entirely” the claimed functions). The claim defines the “central controller” solely by reference to its function:

1. A system for facilitating electronic communications, the system comprising:

a central controller;

...

wherein the central controller is configured to receive information regarding the item status signal and identify the item in connection with a successful transmission of the item status signal from the wireless transmitter;

...

wherein the central controller is further configured to identify the item is based on recognition of the unique identifier of the item stored in the memory;

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wherein the central controller is further configured to perform a processing of a purchase request for the item to increase the household inventory of the item in connection with identification of the item;

wherein the central controller is further configured to communicate information for the processing of the purchase request through a network communication channel to complete the processing of the purchase request, the network communication channel being separate from the wireless transmission channel established for the transmission of the item status signal;

...

wherein the central controller is configured to send confirmation information regarding the processing of the purchase request.

(’443 patent, cl. 1.) The claim recites *what* the central controller does, but it says nothing about *how* it identifies an item using a unique identifier, processes a purchase request, communicates over a network to complete a purchase request, or sends confirmation information. *Cf. St. Isidore Research, LLC*, 2016 WL 4988246, at *14. Indeed, a general-purpose processor or controller could not perform these functions without special programming. (*See* Johnson Decl. ¶ 531.) The central controller must be given information about the format and meaning of the unique identifier of the item, and would need direction as to where the unique identifier is stored in memory. (*Id.*) The claim provides no such information. Plaintiff’s expert provided no contrary opinion.

Plaintiff’s arguments against the application of § 112, ¶ 6 again all ignore *Williamson*’s second requirement that the claim recite structure *to perform the claimed functions*. But its arguments under the first part of the *Williamson* test fare no better. First, it argues that “central controller” connotes structure to one of ordinary skill in the art because a *different* term—“microcontroller”—has a definition in a technical dictionary. (Op. Br. at 32-33.) Even if “*central controller*” was equivalent to a “*microcontroller*” and referred to a “special-purpose, single-chip computer,” (*i.e.*, a processor), the term would not connote structure sufficient to perform the five recited functions, which, as discussed above, require special programming not recited in the claims. *Danco, Inc.*, 2017 WL 4225217, at *7.

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Second, Plaintiff contends that the claim describes the “structural interconnectivity” of the central controller with other elements of the claims because it must “receive[] information about the item status signal . . . from the wireless transmitter” and “identif[y] the item based on recognition of an identifier stored in the memory.” (Op. Br. 33.) But this just regurgitates the claimed functions; it does not show *how* the central controller works with other claim elements to perform the claimed functions. *St. Isidore Research, LLC*, 2016 WL 4988246, at *14.

Third, Plaintiff points to the “central receiver/controller (‘CRC’) 520” and the “WHUB 804” as demonstrating the purported interconnectivity of the controller with other claim elements. (*Id.* at 33-34.) But to avoid § 112, ¶ 6, the claim *itself* must connote structure sufficient to perform the claimed function. *Williamson*, 792 F.3d at 1349. Moreover, the patent describes both the CRC 520 and WHUB 804 solely by their functions. For example, Figure 8 of the ’443 patent shows the WHUB 804 as an empty box that sends and receives information. Figure 6 of the ’443 patent likewise shows the CRC as another empty box that sends notifications in response to a detected change in status from the DCSM. As explained by Dr. Johnson, the CRC would require special programming or an algorithm to carry out the claimed functions. (Johnson Decl. ¶ 542.) Neither Plaintiff nor its expert identifies such algorithm, nor does one exist in the patents. The disclosure of the CRC in the specification cannot connote sufficient structure for the recited computer-implemented functions. *Williamson*, 792 F.3d at 1350 (“module” described in the specification as a black box was a nonce word triggering § 112, ¶ 6). Thus, § 112, ¶ 6 governs the construction of the “central controller.”

Applying § 112, ¶ 6, the claim is indefinite. Plaintiff identifies no structure in the specification for performing the functions of the “central controller.” In the joint claim construction statement, Plaintiff pointed to the CRC and WHUB as providing this structure, but these are insufficient as just described above. (*See also* Johnson Decl. ¶¶ 524-26, 529-31, 535-37,

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540-42, 545-47.) Nor does Plaintiff's expert identify any structure in the specification for performing the functions of the central controller. Because "central controller" does not connote structure for performing the recited functions, and the specification of the '443 patent discloses no structure or algorithm for performing them, this term is indefinite under § 112.

3. "management center system," "management system," "the system"

The terms "management center system," "management system," and "the system" appear in claims 86, 103, and 108 of the '983 patent, claims 38 and 135 of the '918 patent, and claim 52 of the '798 patent. The claims require that these claim elements are "configured" to perform the following functions:

- ***Communicating a phone call over a cellular network and converting data for transmission over a WiFi network*** ('983 patent, cl. 86 ("communicate a phone call with the first mobile terminal, a data from the first mobile terminal and from a cellular network being converted to a converted data for transmission through the WiFi network"), *id.* ("transmit the converted data through the WiFi network to accommodate the phone call");
- ***Communicating information for managing item status or regarding updated item status*** (*id.*, cl. 103 ("communicate information for managing an item status of an item based on a wireless signal regarding an updated status of the item"), *id.*, cl. 108 ("communicate information about an updated status of an item in association with a short range wireless communication regarding the updated status");
- ***Processing and searching for information multimedia information content in response to a request*** ('918 patent, cl. 135 ("perform a processing of the request for the multimedia information content in association with transmission of the multimedia information content to the digital television through a high definition multimedia interface"), *id.*, cl. 38 ("search a content server for the multimedia information content in conjunction with the processing of the request for the multimedia information content"));
- ***Routing multimedia information for production on a television*** (*id.* ("route the multimedia information content to accommodate the production by the digital television")); and
- ***Notifying a user regarding a change in item status*** ('798 patent, cl. 52 ("notify a user of the updated status according to a configuration setting")).

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The terms “management center system,” “management system,” and “the system” do not connote structure sufficient to perform the claimed functions and thus must be construed under § 112, ¶ 6. The terms “management center” and “management system” imply only the generic function of managing something in an unspecified manner. They are well-recognized nonce words. *See Blackboard, Inc. v. Desire2Learn, Inc.*, 574 F.3d 1371, 1385 (Fed. Cir. 2009) (construing “access control manager” under § 112, ¶ 6); *Verint Sys. Inc.*, 166 F. Supp. 3d at 381 (“The term ‘system,’ although qualified as a ‘communication monitoring system,’ does not impart a sufficient structure. ‘System’ standing alone is a nonce word that does not describe a structure that could perform the listed functions and the modifier . . . provides a functional description of the system but no structure.”); *see also* MPEP § 2181 at ¶ I.A. (identifying “system for” as an example of a “nonce” word). On their own, they do not connote any structure—*i.e.*, a specific piece of hardware or an algorithm—to one of ordinary skill in the art, let alone sufficient structure to perform the recited functions. (Johnson Decl. ¶¶ 93, 98, 133, 143, 230, 235, 240, 360, 452); *Danco, Inc.*, 2017 WL 4225217, at *7. For example, claim 86 of the ’983 patent requires as follows:

86. A **management center system** for managing information communications for multiple user terminals comprising:

a mapping table including information of a network address of a WiFi network and information of a unique identifier of a first mobile terminal;
and

a network interface,

wherein the **management center system is configured to communicate a phone call with the first mobile terminal, a data from the first mobile terminal and from a cellular network being converted to a converted data for transmission through the WiFi network;**

wherein the **management center system is configured to transmit the converted data through the WiFi network to accommodate the phone call;**

wherein the **management center system is configured to receive a request for an information content;**

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wherein the management center system is configured to transmit a signal corresponding to information content; wherein the signal comprises a compressed signal; and wherein the compressed signal is decompressed to accommodate production of the information content.

(’983 patent, cl. 86, emphasis added.) The claim describes *what* the management system does, but it says nothing about *how* any of this is done or even how any of these seemingly incongruous steps work together. *Cf. St. Isidore Research, LLC*, 2016 WL 4988246, at *14. Indeed, a generic network adapter could not carry out these claimed functions and instead would have to be combined with a specially-programmed computer. (*See, e.g.*, Johnson Decl. ¶ 95.) For example, the management system must “communicate a phone call with the first mobile terminal” and then transmit a converted signal over a WiFi network. How does the management center communicate a phone call? How does it convert a signal? How does it send a signal over a WiFi network? Each of these steps comprises dozens of subsidiary steps, implicating technological solutions not described in the patents. Similarly, the management center system must be programmed to recognize an identifier registered in a mapping table and would need to be combined with networking equipment to transmit this information. (*See id.* ¶ 120.) The claim provides no explanation for any of this.

Plaintiff’s proposed constructions of the “management center system” and “management system” confirm they are purely functional. Plaintiff proposes construing these terms as “a system for communicating with user devices, sensors, appliances, and/or wireless HUBs for monitoring and/or control.” This construction merely regurgitates the broad functionality of the claimed system.

Plaintiff contends that “management center” connotes *some* structure. It does not, but even if it did, ending the inquiry there ignores the second requirement under *Williamson*: to avoid the application of § 112, ¶ 6, the claim must recite structure *sufficient to perform the claimed function*. Plaintiff’s other arguments also fail. First, it suggests that reciting the term “management center

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system” is recited in the preamble of some claims, it need not recite structure for performing the claimed functions. (Op. Br. at 42.) But simply reciting a term in a preamble does not change the requirements of § 112, ¶ 6, and, in any event, the “management center” and “management center system” terms are recited not only in the preamble but in the body of the claims as well.

Second, Plaintiff argues that the claims impart structure to the management center system because it must be “coupled to the WiFi network” and must work with a digital output interface and a high definition digital television. (Op. Br. at 42-43.) But these are merely incidental to the functions of receiving and transmitting data and displaying content; that the management center interacts with a conventional WiFi network or a conventional high definition display says nothing about the structure of the system itself or *how* it is configured with the other conventional components to perform the claimed functions.

Third, Plaintiff’s expert points to Figure 16 of the ’983 patent as “including specific computer networking elements, such as, among other things, computing and interface devices.” (McAlexander Decl. ¶ 22.) But again, the specification describes the MC System depicted in Figure 16 solely by its function. (’983 patent at 21:32-35 (“a Management Center (MC) System receives, selects, converts, compresses, decompresses, and routs [sic] data to the user terminals”), 21:40-42 (describing MC System as performing “[s]ome processing functions”), 21:51-52 (“[r]eceiving, converting and transmitting multimedia content may be performed”).) Otherwise, the patent describes the MC System using functional black boxes, generic hardware, or conventional communications technology. (*See id.* at 21:64-65 (mapping table and routing module), 22:11-12 (data storage such as a hard disk), 21:19-20 (software for filtering viruses), 22:43-59 (describing wireless communications using TCP packages or according to the WCDMA/3G standard).) Both the “structural interconnection” Plaintiff cites and the disclosures its expert refers to simply describe the functions of the management center, rather than showing

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structure in the claims for performing the functions of the management center system. This again confirms that § 112, ¶ 6 applies. *St. Isidore Research, LLC*, 2016 WL 4988246, at *14.

Because § 112, ¶ 6 applies, to satisfy the definiteness requirement the specification of the asserted patents must disclose an algorithm for the computer-implemented functions recited in the claims. *Williamson*, 792 F.3d at 1351-52; *Augme Techs., Inc.* 755 F.3d at 1337. They do not. In the joint claim construction statement, Plaintiff identifies various components of the MC System as providing structure for the claimed functions. (*See also* ¶¶ 96, 101, 136, 146, 233, 238, 243, 363, 455.) But as discussed above, the MC System is described purely by its function. Dr. Johnson confirms that neither a generic processor nor generic networking equipment can perform the functions without special programming, which is not disclosed in the patents. (Johnson Decl. ¶¶ 94-95, 99-100, 134-35, 144-45, 231-32, 236-37, 241-42, 361-62, 453-54.) Mr. McAlexander does not offer any contrary opinion or otherwise identify any structure in the specification corresponding to these functions. Functional black boxes and generic hardware components cannot constitute sufficient structure for performing the computer-implemented functions. *Intellectual Ventures II LLC*, 2017 WL 5896180, at *33; *Williamson*, 792 F.3d at 1352.

Because the claim terms “management center system,” “management system,” and “the system” do not connote structure for performing the recited functions, and the specifications of the asserted patents disclose no structure or algorithm for performing the functions, these terms are indefinite under § 112.

**4. “wireless signal conversion apparatus,” “signal conversion unit,”
“processing unit”**

The term “wireless signal conversion apparatus” appears in claim 27 of the ’918 patent (on which asserted claim 28 depends), the term “processing unit” appears in claim 9 of the ’918 patent, and the term “signal conversion unit” appears in claim 128 of the ’918 patent. The claims require that these elements are “configured to” perform the following functions:

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- ***Communicating information about updated item status*** ('918 patent, cl. 27 (“communicate, through the wireless communication network, information about an updated status of the household item in conjunction with a short range wireless communication regarding the updated status”));
- ***Receiving and decompressing a compressed video signal*** (*id.*, cl. 128 (“decompress the compressed video signal to a decompressed video signal”), *id.*, cl. 9 (“perform a conversion of the multimedia signal, wherein the conversion of the multimedia signal comprises decompressing, by a decoder, the compressed digital video signal to a decompressed signal”)); and
- ***Converting a decompressed video signal for production on a display and transmitting a converted signal to a destination device*** (*id.*, cl. 128 (“receive the multimedia information content and convert a corresponding signal of the multimedia information content to accommodate the production of the multimedia information content by the digital television”), *id.* (“encode the decompressed video signal to produce an encoded signal for transmission to the digital television through a digital output interface, the encoded signal comprising a decompressed digital video signal”), *id.*, cl. 9 (“transmit the encoded signal to the destination device through a predetermined communication channel in conjunction with a navigational command for the predetermined communication channel”)).¹¹

These terms do not connote structure sufficient to perform the claimed functions and, therefore, must be construed under § 112, ¶ 6. The USPTO has identified the terms “apparatus for” and “unit for” as archetypical examples of “nonce words” to which § 112, ¶ 6 should ordinarily apply. MPEP § 2181 at ¶ I.A (providing a list of “non-structural generic placeholders”). As Dr. Johnson confirms, one of ordinary skill in the art would not understand these terms as providing structure sufficient to perform the functions of communicating information about item status, receiving a decompressed video signal, and converting and encoding the signal for production on a display. (Johnson Decl. ¶¶ 200, 205, 215, 275, 280, 285.) Nor does Plaintiff’s expert Mr. McAlexander provide any contrary opinion.

¹¹ Claim 9 of the '918 patent originally recited a “mobile terminal” configured to perform this function but was later corrected to recite a “wireless signal conversion apparatus.”

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The claims that recite the “wireless signal conversion apparatus,” “signal conversion unit,” and “processing unit” terms define them solely by their function. For example, claim 128 of the ’918 patent requires, in relevant part, as follows:

128. A system comprising:

...

wherein the system further comprises a **signal conversion unit configured to receive the multimedia information content and convert a corresponding signal of the multimedia information content to accommodate the production of the multimedia information content by the digital television;**

wherein the corresponding signal of the multimedia information content comprises a compressed video signal;

wherein the **signal conversion unit is configured to decompress the compressed video signal to a decompressed video signal;** and

wherein the **signal conversion unit is configured to encode the decompressed video signal to produce an encoded signal for transmission to the digital television through a digital output interface, the encoded signal comprising a decompressed digital video signal.**

(’918 patent, cl. 128, emphasis added.) Claim 9 of the ’918 patent recites almost identical functions. The claims generally require that the “processing unit” or “signal conversion apparatus” receive a compressed video signal, decompress the signal, and convert it for display on an output device. But neither the claim terms themselves nor any of the surrounding claim language conveys to one of ordinary skill in the art *how* to do these steps, each of which requires a complex set of subsidiary steps. *Cf. St. Isidore*, 2016 WL 4988246, at *14. Because they do not recite any particular technological solution, they instead claim the result itself no matter how achieved. For this very reason Judge O’Grady held the nearly identical claims of eight related patents invalid under § 101. *See VIS I*, Dkt. 57 at 32 (“[i]nstead of claiming a technological building block, the ’492 patent family’s abstract claims place a ceiling on future innovation,” “[t]he concept of converting a mobile video signal to an HDTV is an abstract concept”).

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Plaintiff again ignores *Williamson*'s holding that § 112, ¶ 6 applies to claims that do not recite structure for performing the recited function. Nor does the appearance of the term in the preamble somehow immunize it from the restrictions of § 112, ¶ 6 (*see* Op. Br. at 44, 46), because the claim also recites the term in the body and defines it solely by its function. The term must be construed under § 112, ¶ 6 regardless of whether it *also* appears in the preamble.

Second, Plaintiff argues that the claims connote structure because they recite a number of other functional black box limitations—"input interface," "decoder," "encoder," "output interface," "mapping table," "database," "management center system," and "wireless hub"—and must be coupled to a wireless network. (Op. Br. at 45, 47.) Plaintiff essentially argues that a functional claim limitation connotes sufficient structure if the claim requires that it interact with *other* functional black box claim limitations. But no case stands for such a proposition. Indeed, Plaintiff's argument only confirms that the claims define "wireless signal conversion apparatus," "signal conversion unit," and "processing unit" only by reference to their function and are therefore subject to § 112, ¶ 6.

Because § 112, ¶ 6 applies, the asserted patents must disclose an algorithm for the computer-implemented functions recited in the claims. *Augme Techs., Inc.*, 755 F.3d at 1337. They do not. A general-purpose processor or network adapter cannot perform the functions of the wireless signal conversion apparatus, signal conversion unit, and processing unit without some special programming or algorithm, and the asserted patents nowhere disclose such an algorithm. (Johnson Decl. ¶¶ 202-03, 207-08, 217-18, 277-78, 282-83, 287-88.) Plaintiff identifies disclosures in the patents of generic networking hardware or functional black boxes, but none provides structure for performing the claimed functions of decompressing, converting, and compressing video signals. (*Id.* ¶¶ 203, 208, 218, 278, 283, 288 (Dr. Johnson's analysis of the structure identified by Plaintiff, including the "MTSCM 1000," the "MC System," and "CRC").)

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Indeed, Judge O’Grady already concluded that the claimed MTSCM referred only to a result and provided no limitation on how that result should be achieved. *VIS I*, Dkt. 57 at 24 (“the MTSCM can be provided by anything that achieves the claimed result”). Such functional black box descriptions do not satisfy the definiteness requirement of § 112 as a matter of law. *Intellectual Ventures II LLC*, 2017 WL 5896180, at *33; *Williamson*, 792 F.3d at 1352.

5. “transmitter,” “wireless transmitter”

The “transmitter” and “wireless transmitter” terms appear in claim 110 of the ’983 patent and claim 1 of the ’443 patent. The claims require that the “transmitter” terms are “configured to” transmit a signal through a wireless transmission channel in response to a change in item status. (’983 patent, cl. 110 (“transmit, through a wireless transmission channel, a signal in connection with an initiation of a replenishment of an inventory of an item, the signal being transmitted through the wireless transmission channel in response to an indication of an updated status of the item, the signal comprising information corresponding to a unique identifier of the wireless device, information about the inventory of the item being stored in a database, a requirement of the item being included in the information about the inventory of the item”); ’443 patent, cl. 1 (“transmit, through a wireless transmission channel, an item status signal in connection with an initiation of an increase of a household inventory of an item, the wireless transmission channel being established for transmission of the item status signal in a local wireless communication network in response to an indication of an updated status of the item”); *see also id.* (requiring that the “wireless transmitter” is “designated to transmit the item status signal”).)

The “transmitter” terms do not connote structure sufficient to perform the specific algorithms claimed in the asserted patents, and § 112, ¶ 6 therefore applies. Though the term “wireless transmitter” refers to a generic class of structure, it does not connote structure sufficient to perform entirely the claimed functions. (Johnson Decl. ¶¶ 148, 514); *Danco, Inc.*, 2017 WL

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4225217, at *7; *see also St. Isidore Research, LLC*, 2016 WL 4988243, at *14 (generic processor governed by § 112, ¶ 6 because in context of claims it was defined by its function). Indeed, a generic wireless transmitter and processor would not be able to recognize a signal corresponding to a change in item status or a change in household inventory without special programming. (Johnson Decl. ¶ 155.)

The claims define the transmitter terms solely by their function. For example, claim 110 of the '983 patent requires a “wireless device configured to facilitate electronic communications” comprising a transmitter configured to perform the claimed function. It does not recite any other claim limitations. Claim 1 of the '443 patent recites a corresponding system, comprising the wireless transmitter and two functional limitations (“memory” and “central controller” configured to perform functions). Aside from its function, the only additional description of the “wireless transmitter” is that it must be “associated” with an item. Nothing in the claim would inform one of ordinary skill in the art *how* a generic wireless transmitter could be configured to perform the claimed functions.

The opinion of Plaintiff’s expert Mr. McAlexander only confirms the functional nature of the wireless transmitter terms. He opines that one of ordinary skill in the art would understand the “wireless transmitter” to refer to one of the “known variet[ies] of transmitters”—*i.e.* generic networking equipment. (McAlexander Decl. ¶ 18.) He states that the “wireless transmitter” would “serve[] the conventional interface role of transmitting information wirelessly,” and that one of ordinary skill in the art would understand the term to mean “device for wirelessly sending information configured to transmit . . . in response to an indication of an updated status of the item.” (*Id.*) Mr. McAlexander points to nothing in the patents that would explain how to accomplish the functions of recognizing an item status signal and transmitting a signal in response to a change in item status. Instead, the construction only repeats the high-level function of the

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wireless transmitter—transmitting a signal wirelessly. Thus, even Plaintiff’s expert agrees the patents define this term only by its function.

Plaintiff’s arguments in its brief again ignore the second prong of the *Williamson* test for rebutting the presumption against the application of § 112, ¶ 6—whether the claims recite structure for performing the claimed function. Its arguments as to the first prong also miss the mark. First, Plaintiff contends that the term “transmitter” must connote structure because it appears in a technical dictionary. (Op. Br. at 28.) But as noted above, it is not enough to recite a generic computing component; to avoid § 112, ¶ 6, a claim term must connote sufficient structure to perform the claimed function. *Danco, Inc.*, 2017 WL 4225217, at *7. Second, Plaintiff contends that the addition of the qualifier “wireless” provides “adjectival qualification.” But the functions recited in the claims require more than just basic wireless transmission; Plaintiff points to nothing in the claims that would connote structure for performing the recited functions. And in any event, adding a functional qualifier like “wireless” to a functional claim term cannot save it from § 112, ¶ 6. *See Nichia Corp.*, 2019 WL 1966664, at *6; *Lochner Tech., LLC*, 2015 WL 293625, at *13-14. Third, Plaintiff argues that the claims and specification describe “structural interconnectivity” with a wireless transmission channel and the DCSM. (Op. Br. at 29.) Plaintiff is wrong. Communication over a wireless channel is inherent in the function itself and, indeed, any generic wireless transmitter. The fact that the transmitter may be integrated into other functional black boxes—the DCSM and CRC—also does not provide structure for performing the claimed functions. Indeed, as Dr. Johnson confirms, the CRC and DCSM could not perform the functions of the “wireless transmitter” without special programming. (*See, e.g.*, Johnson Decl. ¶¶ 150-51, 516-17.) Mr. McAlexander provides no contrary opinion.

Because § 112, ¶ 6 applies, to satisfy the definiteness requirement the specification of the asserted patents must disclose an algorithm for the computer-implemented functions recited in the

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claims. *Williamson*, 792 F.3d at 1351-52; *Augme Techs., Inc.* 755 F.3d at 1337. They do not. (Johnson Decl. ¶¶ 54-56, 149-51.) Plaintiff identifies the CRC and DCSM as providing structure for the claimed functions of the wireless transmitter terms, but these are nothing but black boxes that do not provide the required algorithm as a matter of law. (*Id.* ¶¶ 151, 517 (Dr. Johnson’s opinion that the “CRC” and “DCSM,” do not provide structure for the functions of the claimed transmitter).) *Intellectual Ventures II LLC*, 2017 WL 5896180, at *33; *Williamson*, 792 F.3d at 1352.¹² The “transmitter” and “wireless transmitter” “configured to” terms are thus indefinite under § 112.

6. “program code that includes instructions executable by said processor,” “program code executable by the processor”

The terms “program code that includes instructions executable by said processor” and “program code executable by the processor” appear in claim 29 of the ’443 patent and claim 99 of the ’918 patent (from which asserted claims 112 and 113 depend), respectively.¹³ Claim 29 of the ’443 patent requires program code for (1) transmitting an item status signal in response to an increase in household inventory based on updated item status; (2) recognizing a unique identifier and user account corresponding to a wireless device; and (3) processing a purchase request by sending user account and payment information. (*See* ’443 patent, cl. 29.) Claim 99 of the ’918 patent requires program code for (1) receiving a compressed digital video signal; (2) decompressing the video signal; and (3) converting the signal and encoding it for production by a digital television. (*See* ’918 patent, cl. 99.) Both claims define the “program code” and related “instructions” solely by the functions they perform. But each of these functions is a complex

¹² Amazon and HTC no longer seek construction of the “input interface” and “network interface” “configured to” claim terms.

¹³ In the joint claim construction statement, due to a clerical error, Defendants proposed construction of the broader term “memory configured to store program code.” Defendants do not propose construing the term “memory” under § 112, ¶ 6, and their argument here is limited to “program code.”

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operation consisting of subsidiary steps for which the claims provide no algorithm. (*See* Johnson Decl. ¶¶ 375, 599.) Such claims are governed by § 112, ¶ 6. *Global Equity Mgmt. (SA) Pty. Ltd. v. Expedia, Inc.*, No. 2:16-cv-00095-RWS-RSP, 2016 WL 7416132, at *27-29 (E.D. Tex. Dec. 22, 2016) (“*GEMSA*”).

In *GEMSA*, the court considered the construction of the term “program code for configuring said at least one partition of said at least one secondary storage device through a secondary storage partitions window.” *Id.* The court concluded that the term should be construed under § 112, ¶ 6, and the defendants had rebutted the presumption against the application of § 112, ¶ 6 to terms that did not recite means, because the term was “defined only by the function that it performs,” and the claims neither recited the “objectives and operations” of the code nor specified “[h]ow the code interacts with other code.” *Id.* at *29. The same is true here.

Both claim 29 of the ’443 patent and claim 99 of the ’918 patent describe only a function to be performed by some code with no description of *how* the code operates to perform the function or achieve the result. (*See, e.g.*, Johnson Decl. ¶¶ 375-76, 599-600.) For example, claim 29 of the ’443 patent does not describe *how* the claimed program code operates to detect and recognize a signal corresponding to a change in item status. It does not describe *how* the code operates to recognize a unique identifier or a user account. It does not describe *how* the code operates to process a purchase request. The hard work of devising actual solutions to these problems is left to others to figure out using only the generic components described in the patent, such as a wireless network interface or a processor, which cannot perform these functions without special programming. (*Id.* ¶ 377.) Similarly, claim 99 of the ’918 patent does not describe *how* the code operates to decompress a video signal or to compress/encode the signal for display on a television. Like the term at issue in *GEMSA*, the “program code” terms here must be construed under § 112, ¶ 6. *See GEMSA*, 2016 WL 7416132, at *27-29; *Williamson*, 792 F.3d at 1348 (presumption

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against application of § 112, ¶ 6 to non-means terms rebutted if claim “recites ‘function without reciting sufficient structure for performing that function.’”) (citation omitted).

Because the claims do not recite structure for performing the computer-implemented functions, the patents must instead disclose an algorithm for performing them to comply with § 112, ¶ 6. *Williamson*, 792 F.3d at 1351-52; *Augme Techs., Inc.* 755 F.3d at 1337. They do not. Plaintiff points to “memory in MTSCM 1000” and “memory (see WHUB 804), or sensing module 510” as structure for the functions recited by claim 29 of the ’443 patent and claim 99 of the ’918 patent. But these are generic hardware or functional black boxes; they cannot perform the functions recited in the claims unless specially programmed. (Johnson Decl. ¶¶ 602, 378.) Moreover, because the claims recite computer-implemented functions, the patents must disclose an algorithm or a specially-programmed computer. *See, e.g., Augme*, 755 F.3d at 1337. The patents do not disclose an algorithm. Neither Plaintiff nor its expert Mr. McAlexander identifies such an algorithm in the specifications. These terms are therefore invalid under § 112.

B. “updated status [of the item]”/ “updated item status”

Defendants’ Construction¹⁴	Plaintiff’s Construction
A detected change in the status / a detected change in the item status	Current condition or amount of an item

The Court should construe an updated item status¹⁵ as “a detected change in the [item] status” because the patent claims, specification, and Judge O’Grady’s prior construction of the same term (“item status”) and a related term (“updated condition of a merchandise”) all consistently describe an “updated” status as a *detected change* in status. Nothing in the

¹⁴ “Defendants” in this and the following chart headings refers to the Defendants who seek construction of the term in question. (*See supra* note 3.)

¹⁵ The term “updated status [of the item]” / “updated item status” is recited in claims 22, 24, 27, 62, 64, 105, 108, 117, 143 of the ’983 patent, claims 1 and 29 of the ’443 patent, claims 5, 52, and 60 of the ’798 patent, and claim 112 of the ’918 patent.

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specification supports Plaintiff's broader construction covering *any* "current condition or amount of an item."

The claims reciting these limitations each make clear that they require a detected change in the item status. For example, claim 22 of the '983 patent requires that "the wireless HUB system is further configured to communicate, through the network communication channel, information for managing an item status of an item in connection with a short range wireless communication regarding an updated status of the item." ('983 patent, cl. 22.) Dependent claims across the asserted patents require that a wireless connection be "triggered by a detection of the updated status." (E.g., '983 patent, cl. 27 ("triggered by a detection of the updated status"); '443 patent, cl. 1 ("in response to an indication of an updated status of the item"); '798 patent, cl. 5 ("triggered by a detection . . . of the updated status"); '918 patent, cl. 112 ("initiated by a detection, by a sensor, of the household item status").) Plaintiff's proposed construction would lead to a nonsensical result: a wireless connection would be constantly "triggered" based on any "current condition or amount of an item," rather than based on a detected change in item status as the patents describe. Plaintiff's contention that the "updated" status" could be any "condition," including the amount of an item, is contradicted by the plain language of the claims. It is thus not surprising that Plaintiff does not discuss the claims in its argument. (*See* Op. Br. at 10-12.)

The specifications of the asserted patents confirm that an updated status is a detected change: they define "the present invention" as "accommodat[ing] the delivery of diaper status *updates*." (E.g., '983 patent, Figs. 5, 7, 8; '443 patent at 3:5-9.) The specifications refer to "updated item status" exclusively as a *detected change* in the diaper. For example, the specifications describe that "[w]hen the diaper condition *changes*, such as when it is wet," the DCSM sensor "*detects the updated condition*," and the DCSM transmitter then sends "the diaper condition *update*." ('983 patent at 14:7-10 (emphases added); *see also id.* at 12:54-13:2 (The

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DCSM's sensor monitors the diaper for "one or more . . . conditions, whose results indicate whether the diaper is wet or not.") Figure 7 is a flow diagram of the diaper monitoring system, and shows that the DCSM monitors the diaper condition and sends a "condition update" to the CRC when "the diaper is determined to be wet." (*Id.* at Fig. 7; 13:5-6.) In the purported invention, therefore, an "updated status" is this *detected change*, not merely a current condition.

Notably, the court in the Eastern District of Virginia construed nearly identical terms in a related patent consistent with Defendants' proposal, and rejected Plaintiff's overly broad proposed construction of "any condition of an item." *VIS I*, 2017 WL 3599642, at *17. There, Judge O'Grady construed the term "an updated condition of a merchandise," from the related '844 patent,¹⁶ to mean "a *detected change* in the condition of an item." *Id.* at *16-17. The '844 patent uses the term "an updated condition of a merchandise" to refer to the same concept in at issue here. *Id.* at *16. In the '844 patent, "a sensor in a diaper reads the wetness and other qualities of the diaper and sends a corresponding update to alert the appropriate caregiver that the diaper needs changing." *Id.* at *13. [REDACTED]

[REDACTED]

[REDACTED]

The court noted "the updated condition is universally referred to in the context of the diaper's status, and in particular, the need to change the diaper because it has been soiled." *Va. Innovation Scis.*, 2017 WL 3599642, at *17. This "requires some *change* or event to begin the process;" the patent "presumes some event that prompts the user alert" rather than "a continuous stream of information providing real-time updates to the user." *Id.* (emphasis added). Thus, in order to give effect to the claim language "updated," Judge O'Grady construed the term to require "a detected

¹⁶ The '443 patent is a continuation of the '844 patent and both patents share the same title, inventors, and specification.

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change in the condition of an item.” *Id.* The intrinsic evidence supports the same conclusion here for an updated item status.

Plaintiff relies on Figures 7 and 8 of the ’983 patent in support of its construction, but ignores the descriptions in those figures and the related portions of the specification. (Op. Br. 10-11.) As noted previously by Judge O’Grady, Figure 7 confirms that “the wetting of the diaper”—*i.e.*, a *change* in item status—“triggers the condition update.”¹⁷ *VIS I*, 2017 WL 3599642, at *17. Indeed, Figure 7 specifies that the DCSM “sends [a] condition update to CRC *when the diaper is determined to be wet*,” not merely based on any “condition.” (’983 patent at Fig. 7.)

Also contrary to Plaintiff’s contention, the specifications do not describe the central controller (CRC) shown in Figure 7 as “periodically polling” the DCSM to determine the current condition of a diaper. (See Op. Br. at 11.) Rather, it describes that the DCSM detects whether a diaper is wet, and transmits a signal to the CRC “to inform the CRC 520 that the diaper is wet.” (’983 patent at 13:3-6, Fig. 7; *see also id.* at 14:7-11 (“When the diaper condition changes, such as when it is wet, the DCSM sensor detects the updated condition of the diaper. When this occurs, the DCSM transmitter sends 704 the diaper condition update to the CRC.”).) The patents describe one scenario in which, after receiving the diaper wetness signal, the CRC may poll the DCSM “after a given period of time,” but this merely describes the timing for sending an alert of the “updated” (*i.e.*, *changed*) status to a caregiver. (’983 patent at 14:27-40.) For example, a parent may want a delay before being notified that the DCSM detected a wet diaper (to provide time for a babysitter to change the diaper), while a babysitter may want to be notified immediately. (*Id.* at 14:29-40.)

Figure 8 similarly depicts the “wet diaper condition” triggering the updated item status. (’983 patent, Fig. 8; *see also id.* at 14:64-65 (describing the system depicted in Figure 8 as

¹⁷ Figure 7 of the ’844 patent is identical to Figure 7 of the asserted patents in this case. (Compare ’844 patent, Fig. 7, with ’983 patent, Fig. 7.)

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providing “a coupon or other incentive” in connection “with the determination that a diaper is wet by the DCSM”).) While the specification states that the wireless HUB “may keep a database of household requirements and inventories” (*id.* at 14:67-15:1), it does not describe diaper inventory or any other inventory as an *updated item status*. The specification consistently describes the updated item status as a wet diaper detected by the DCSM. (*Id.* at 15:14-16.) That the wireless HUB can store *other information* such as inventory is irrelevant. Indeed, the claims clearly show that an inventory of an item is *different from* an updated item status. (*See, e.g.*, ’983 patent claims 48, 83, 94, 104 (referring to “inventory information of an item” and to replenishing “an inventory of an item in connection with the updated status”).)

Plaintiff’s proposed construction improperly broadens and alters the meaning of “updated status [of the item]” / “updated item status.” The Court should adopt Defendants’ proposed construction, which is consistent with the claims, specification, and Judge O’Grady’s construction of the same and related terms.

C. “item status signal”

Defendants’ Construction	Plaintiff’s Construction
A signal conveying information regarding the status of an item	Signal corresponding to a condition or amount of an item

Claims 1, 16, and 29 of the ’443 patent require an “item status signal,” which Judge O’Grady construed to mean “a signal conveying information regarding the status of an item.” *Va. Innovation Scis.*, 2017 WL 3599642, at *16. Plaintiff is bound to the court’s previous construction under the doctrine of collateral estoppel. Collateral estoppel applies where, as here, (1) the issue is identical to the one in the prior litigation; (2) the issue was actually litigated; (3) the ruling formed a necessary part of the judgment; and (4) the party against whom estoppel applies had a full and fair opportunity to litigate the issue in the previous lawsuit. *See, e.g., Rabo Agrifinance, Inc. v. Terra XXI, Ltd.*, 583 F.3d 348, 353 (5th Cir. 2009).

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Here, Judge O’Grady construed the identical term—“item status signal”—in the context of the ’844 patent, from which the asserted ’443 patent is a continuation. Construction of the same term in a related patent is an identical issue for purposes of collateral estoppel. *Nestle USA, Inc. v. Steuben Foods, Inc.*, 884 F.3d 1350, 1352 (Fed. Cir. 2018) (applying collateral estoppel where there was no “material difference between the two patents or their prosecution histories that would give rise to” a difference in claim construction issues); *cf. Swartz v. U.S. Patent & Trademark Office*, 743 F. App’x 426, 428 (Fed. Cir. 2018) (affirming application of collateral estoppel to claims that were “[s]ubstantially identical claims” of related patent application previously found invalid), *cert. denied*, 139 S. Ct. 1279 (2019), *reh’g denied*, 139 S. Ct. 1597 (2019).

VIS had the full opportunity to present its proposed construction in that case. *Va. Innovation Scis.*, 2017 WL 3599642, at *16. And it stipulated to entry of judgment of non-infringement of the ’844 patent in light of the court’s construction.¹⁸ This Court should accordingly preclude VIS from advancing a new construction in this case. *See e.Digital Corp. v. Futurewei Techs., Inc.*, 772 F.3d 723, 727 (Fed. Cir. 2014) (observing that courts may apply collateral estoppel to preclude arguments contrary to prior construction where the issue is identical); *Hemphill v. Proctor & Gamble Co.*, 85 F. App’x 765, 767 (Fed. Cir. 2004) (affirming application of collateral estoppel where the meaning of claim terms at issue was “identical to the meaning” of the same terms construed in an earlier case). That ruling should also bind Innovation, which represented to the Court that it has succeeded to VIS’s rights and liabilities by operation of Texas law. (Dkt. 29.)

In any event, Plaintiff offers no basis for this Court to depart from Judge O’Grady’s construction. *See Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 390 (1996) (stressing “the importance of uniformity” in claim construction); *Omega Eng’g, Inc. v. Raytek Corp.*, 334

¹⁸ Plaintiff accuses the same product here—Amazon’s Dash Button—of infringing the ’443 patent as it did in *VIS I* for the ’844 patent.

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F.3d 1314, 1334 (Fed. Cir. 2003) (“we presume, unless otherwise compelled, that the same claim term in the same patent or related patents carries the same construed meaning”). Judge O’Grady noted “the claims all refer to ‘the item status’ as the information that is conveyed about the item (e.g., the diaper) that is being monitored by the wireless sensor.” *Va. Innovation Scis.*, 2017 WL 3599642, at *15. He thus determined “that the term is self-defining in that the ‘item status signal’ reflects the status of the monitored item.” *Id.* The claimed “signal” is “the vehicle through which the information regarding the change in the condition of the merchandise is conveyed, and it is consistently used in that context.” *Id.* at *16. By reading “status” out of the claim—so that the signal can be *anything* related to the item—the court found that “VIS ha[d] revealed its intention to argue for an inappropriately broad meaning of the term” for litigation purposes. *Id.* at *15-16.

Plaintiff has simply taken the same arguments to another forum hoping for a different result. But its proposed construction finds no support in the patent. The claims recite transmission of the “item status signal” “in response to an indication of an updated status of the item” (’443 patent at 13:50-52) or “based on an indication of an updated status of the item” (*id.* at 16:1-6). The specification describes the transmission of diaper status updates upon detection that the diaper is wet. (*Id.* at 3:5-7.) When the sensor detects wetness, it “triggers the transmitter 514 to establish a wireless communication channel between itself and the CRC 520” and the transmitter sends a signal to inform the CRC. (*Id.* at 10:48-51.) The RFID embodiment, cited by Plaintiff (Op. Brief at 16), does not alter that. It still requires the transmission of a signal that conveys information that the diaper is wet. (’443 patent at 10:48-51, 11:5-14.) This Court should adopt Judge O’Grady’s construction, which is supported by the claim language and specification, and reject Plaintiff’s proposed deviation from that construction.

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D. “[a/the] short range wireless communication [channel]”

Defendants’ Construction	Plaintiff’s Construction
Wireless communication with a communication range of up to a few centimeters	Zigbee or the equivalent.

Claims 22, 27, 105, 108, and 143 of the ’983 patent, claims 5, 6, and 60 of the ’798 patent, and claims 112 and 113 of the ’918 patent require a “short range wireless communication” to communicate item status with the HUB.

The specification never uses the phrase “short range wireless communication” or “short range wireless communication channel,” but describes use of short range wireless communication for a single purpose: to authenticate a mobile device for secure mobile payment. With reference to Figure 3, the specification describes a cellular phone 310 equipped with an NFC tag 312 and a wireless HUB 320 equipped with an NFC reader 322. (’983 patent at Fig. 3; *id.* at 10:43-11:2.) The cellular phone and wireless HUB are also each equipped with a WPAN transceiver.

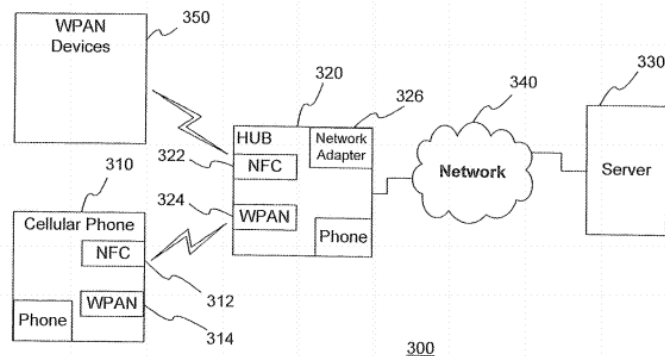


FIG. 3

(*Id.*) When the cellular phone is placed near the HUB 320, the HUB’s NFC reader 322 reads the phone’s NFC tag 312 to authenticate the cellular phone. (*Id.*) The specification emphasizes that the HUB utilizes short range communication to authenticate the cellular phone. (*Id.* at 10:46-50 (“NFC provides short-range wireless connectivity that uses magnetic field induction to enable communication between the devices.”); *id.* at 10:57-59 (“The NFC technology accommodates secure and automatic authentication and data exchange between the NFC tag and NFC reader.”); *id.* at 30:32-36 (The wireless HUB “authenticates user’s identification through a short range Electromagnetic (EM) radiation”).) The specification identifies NFC as the “preferred” method

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of short range communication because it has a range “of a few centimeters, which is believed to be advantageous for applications of this aspect of the present invention.” (*Id.* at 10:43-54.) Defendants’ construction captures the description of “short range” wireless communication in the specification as being wireless communication with a communication range of up to a few centimeters.

Once the HUB authenticates the phone, it can establish a “secure wireless connection” in which the HUB and cellular phone can communicate using their WPAN transceivers to make secure payments from the cellular phone. (*Id.* at 11:3-28.) The specification emphasizes that this “secure communication channel is separate from the short range wireless connection.” (*Id.* at 30:65-31:5.) It further explains that WPAN is preferable for the secure communication because it has a “longer operational range compared to NFC.” (*Id.* at 11:5-8.)

The specification explains that the secure mobile payment embodiment is implemented using three types of networks: 1) a cellular network, 2) a wireless personal area network (WPAN), and 3) wireless identification technology. (*Id.* at 10:17-27.) It then explains that the cellular network applies “3G technology,” the WPAN applies “Zigbee, Bluetooth, or UWB technologies,” and the wireless identification technology applies short range wireless communication: “RFID (e.g., NFC).” (*Id.*)

Plaintiff’s construction of “short range wireless communication” as “Zigbee or the equivalent” conflates the disclosed short range channel used for authentication with the WPAN channel used for secure communications after authentication is complete. Zigbee is only described in the specification for use as the WPAN secure channel, which the specification expressly distinguishes from the short range communication channel used for authentication. (*Id.* at 10:17-27; *id.* at 30:65-31:5.) The HUB utilizes short range communication of up to a few centimeters to read and authenticate the NFC tag in the cellular phone. After authenticating the phone, the HUB

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securely communicates with the phone using a WPAN network, such as Zigbee, different from the NFC communication. *See, e.g., Ruckus Wireless, Inc. v. Innovative Wireless Sols., LLC*, 824 F.3d 999, 1004 (Fed. Cir. 2016) (rejecting claim construction covering subject matter with no written description in the specification, noting “a claim ‘may be no broader than the supporting disclosure’”) (quoting *Gentry Gallery, Inc. v. Berkline Corp.*, 134 F.3d 1473, 1480 (Fed. Cir. 1998)).

Plaintiff’s construction fails for two other reasons. First, Plaintiff’s construction fails under the doctrine of claim differentiation as it renders redundant the dependent claims that recite “wherein the short range wireless communication is a Zigbee communication.” (’918 patent at claims 30, 40, 81, 97, 113; ’798 patent at claims 6, 37, 60, 78, 93; *see also* ’983 patent at claims 34, 39, 114, 125, 136.)¹⁹; *L.C. Eldridge Sales Co. v. Azen Mfg. Pte. Ltd.*, No. 6:11cv599, 2013 WL 2285746, at *5 (E.D. Tex. May 23, 2013) (quoting *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 910 (Fed. Cir. 2004)) (rejecting proposed construction under the doctrine of claim differentiation because “the presence of a dependent claim that adds a particular limitation raises a presumption that the limitation in question is not found in the independent claim”), *aff’d sub nom. L.C. Eldridge Sales Co. v. Jurong Shipyard Pte., Ltd.*, 610 F. App’x 1015 (Fed. Cir. 2015). Second, it is unclear what Plaintiff means by “the equivalent.” It provides no metes and bounds to the claim and merely adds confusion rather than clarity about the scope of the claim term.

Accordingly, the Court should reject Plaintiff’s construction and adopt Defendants’ construction.

¹⁹ For reasons provided in the next section below, each of these claims lack adequate written description.

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- E. “wherein the short range wireless communication is a Zigbee communication” / “wherein the wireless [transmission] channel is a Zigbee channel”**

Defendants’ Construction	Plaintiff’s Construction
Lacks written description under 35 U.S.C. § 112.	<p>“wherein the short range wireless communication is a Zigbee communication”:</p> <p>A short range wireless communication that is a Zigbee protocol communication.</p> <p>“wherein the wireless [transmission] channel is a Zigbee channel”:</p> <p>A wireless [transmission] channel that is a channel for communicating Zigbee protocol messages.</p>

Claim 6 of the ’798 patent and claim 113 of the ’918 patent each recite a “short range wireless communication” that is “a Zigbee communication.” Claim 39 of the ’983 patent similarly recites “the wireless channel is a Zigbee channel,” and depends from claim 22 which recites “a wireless channel for the short range wireless communication.” These claims were added during prosecution of their respective patents in 2017, over a decade after the priority date for the patents. (Ex. 4 (’983 Patent File History, June 19, 2017 Amendment); Ex. 5 (’798 Patent File History, Mar. 15, 2016 Amendment); Ex. 6 (’918 Patent File History, Jan. 26, 2017 Amendment).) These terms lack an adequate written description.

The specification must “contain a written description of the invention, and of the manner and process of making and using it, in [] full clear, concise, and exact terms.” 35 U.S.C. § 112, ¶ 1. In other words, the specification must objectively demonstrate to a person of ordinary skill in the art that the applicant actually invented the claimed subject matter. *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc).

Zigbee is mentioned only three times in the specification and for two different embodiments, neither of which provides adequate written description for the recently amended claims. As explained for the term immediately above, Zigbee is identified in the secure mobile

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payment embodiment as an example of a WPAN network. In this embodiment, Zigbee is used for secure communication between a mobile device and a HUB after the HUB authenticates the mobile device on a separate short range wireless communication channel (e.g., NFC). (*Id.* at 10:17-27; *id.* at 30:65-31:5.) The specification therefore distinguishes Zigbee from the short range wireless communication channel.²⁰ (*Id.*)

Accordingly, the Court should hold that these claims lack written description under 35 U.S.C. § 112.

F. “merchant information”

Defendants’ Construction	Plaintiff’s Construction
Plain and ordinary meaning. No construction necessary.	Purchase information

The Court should construe the phrase “merchant information,” recited in claim 110 of the ’983 patent (and thus incorporated into the asserted dependent claim 116), according to its plain and ordinary meaning. “The plain meaning of claim language ordinarily controls unless the patentee acts as his own lexicographer and provides a special definition for a particular claim term or the patentee disavows the ordinary scope of a claim term either in the specification or during prosecution.” *InterDigital Commc’ns, LLC v. Int’l Trade Comm’n*, 690 F.3d 1318, 1324 (Fed. Cir. 2012). Neither exception applies here, so the plain meaning controls.

The ’983 patent describes “merchant information” consistent with its plain meaning. The patent refers to a “merchant” as a commercial entity that sells goods. (’983 patent at 8:44-47 (“merchants or other commercial entities”); *id.* at 25:59-63 (“Merchants or other commercial entities”); *id.* at 15:45-46 (merchant may be “a provider of several items (such as a supermarket)”);

²⁰ The specification also notes once that Zigbee “may be useful for many applications” of the diaper wetness sensing embodiment. In that embodiment, the diaper condition sensing module (DCSM) includes a sensor that detects when the diaper is wet and a transmitter that communicates wirelessly to inform the CRC when the diaper is wet. (’983 patent at 13:3-17.) This embodiment does not describe using short range wireless communication and does not describe Zigbee as a short range wireless communication protocol.

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id. at 14:62-63 (providing an example of a merchant that “sells diapers”).) “Merchant information” is information provided by the merchant. (*Id.* at 15:5-8 (“an additional alert may be presented to the user so that they are aware that they need diapers and they can get the discount if they buy brand x based upon the *information provided by the local merchant*”) (emphasis added); *id.* at 14:64.)

Plaintiff seeks to read out the term “merchant” and rewrite the phrase to “purchase information.” Simply substituting one claim term (i.e., “merchant”) for a new term with a different meaning (i.e., “purchase”) is an improper use of claim construction. Although “merchant information” may include purchase information, it may also be other information, such as which merchants are “local,” and advertisements from those local merchants. (*See id.* at Fig. 8 (referring to “Local Merchant info”), 25:34-58 (describing information relevant to a “particular location”); *see also* col. 8:44-52 (describing “advertisements” from merchants), 25:59-63 (same).)

Because the factfinder would readily understand the phrase “merchant information,” and because Plaintiff’s construction does not reflect the proper meaning of the term as provided by the patent, the Court should reject Plaintiff’s proposed construction and instead find that plain and ordinary meaning applies. *See Luv N’ Care, Ltd. v. Jackel Int’l Ltd.*, 115 F. Supp. 3d 808, 823 (E.D. Tex. 2015) (construing the disputed term according to its plain meaning, finding that proposed construction would not be “necessary or helpful to the jury”).

G. “a requirement of the item”

Defendants’ Construction	Plaintiff’s Construction
Plain and ordinary meaning. No construction necessary.	Required characteristic of the item

The Court should construe the phrases “a requirement of the item,” recited in claim 110 of the ’983 patent, and “a purchase requirement of the item” recited in claims 1 and 29 of the ’443 patent, according to their plain and ordinary meaning. The ’983 and ’443 patents describe these

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terms as a quantity of the item. The patents describe two types of requirements: (1) a requirement to purchase items (e.g., diapers) when the inventory drops to a threshold amount, and (2) a requirement to purchase a particular number of items. (*See, e.g.*, '983 patent at 14:66-15:28.) Plaintiff itself acknowledges that the “‘requirement of the item’ recited in the claim is a reference to a . . . quantity of the item being replenished.” (Op. Br. at 9-10.)

Even though a lay jury will readily understand the plain meaning of these terms, Plaintiff proposes injecting a new limitation that in fact changes their meaning. It suggests the Court construe them to mean a “required *characteristic* of the item,” which improperly suggests that the “requirement” is a feature or quality of an individual item, such as its color or size. Plaintiff argues that a “characteristic” of an item could include information about its quantity, but that argument strains the meaning of the word. Plaintiff also fails to explain why its proposed construction would provide more clarity on this point than plain meaning, and indeed, it would not. Changing the term “requirement” to “required characteristic” only creates ambiguity and suggests that the claim term potentially excludes requirements relating to quantity. The Court should reject Plaintiff’s construction. *See InterDigital Commc’ns*, 690 F.3d at 1324 (“plain meaning of claim language ordinarily controls”); *Luv N’ Care*, 115 F. Supp. 3d at 823 (rejecting proposed construction would not be “necessary or helpful to the jury”).²¹

IV. CONCLUSION

For the foregoing reasons, the Court should adopt Defendants’ proposed constructions and indefiniteness positions.

June 6, 2019

Respectfully submitted,

By: /s/ Saina S. Shamilov

²¹ Defendants no longer seek a construction that the preambles of all asserted claims are limiting.

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that all counsel of record who are deemed to have consented to electronic service are being served with a copy of this document via email on June 6, 2019.

/s/ Saina S. Shamilov

Saina S. Shamilov

CERTIFICATE OF AUTHORIZATION TO FILE UNDER SEAL

I hereby certify that the foregoing document is authorized to be filed under seal pursuant to the Protective Order entered in this case.

/s/ Saina S. Shamilov

Saina S. Shamilov